**Investigating Climate Change in Duke Forest June 20, 2012**

**Seedling establishment and climate change 9:15AM- 9:45AM**

*Dan Johnson, Research Scientist, Center on Global Change, Duke University*

Learn from an onsite investigator who is seeking a more thorough understanding of young seedling biology and mechanisms of establishment for forest regeneration in a changing climate. Current research in this area includes field trials, rainout shelters, isotopic determination of reliance of young seedlings on seed reserves versus photosynthetic carbon gain, vulnerability of young seedlings to hydraulic dysfunction.

***Dan Johnson Website***

[**http://www.duke.edu/~dj74/Research.html**](http://www.duke.edu/~dj74/Research.html)

**The Forest-Atmosphere Carbon Transfer and Storage Facility 9:50AM-10:45AM**

*Guide: Jeff Pippen, Instructor and Associate in Research, Duke University*

Learn from an onsite investigator who is studying how elevated atmospheric CO2 levels impact a loblolly pine forest. From 1996 to 2010 this research facility consisted of four free-air CO2 enrichment (FACE) plots that provided elevated atmospheric CO2concentration and four plots that acted as ambient CO2 controls. Although the CO2 is no longer being pumped into the plots, growth in the unharvested quadrants will continue to be monitored through the end of 2012. The CO2 was turned off at the end of October 2010, and from October 2010 through April 2011 two of the four quadrants in each plot were harvested to determine total above-ground biomass and carbon allocation. Below-ground harvest occurred May-June 2011 and involved removing the soil 1.5m x 1.5m around each of two stumps per harvest quadrant to determine course root and rock volumes. Soil was excavated to depths of 30, 60, 90, or 120cm. Teachers will learn how increased CO2 impacts above-ground tree growth and below-ground carbon dynamics.

***Duke FACE Site – Additional Information***

<http://face.env.duke.edu/main.cfm>

<http://www.nicholas.duke.edu/people/faculty/katul/project4.html>

<http://www.duke.edu/~jspippen/work/face.htm>

***Student Video about the FACE Site (3 Minutes)***

<http://swetnet.wikispaces.com/>

**Global Warming and Forests 11:00AM-11:30AM**

*Guide: Becky Roper, Research Technician, Jim Clark Lab, Nicholas School of the Environment, Duke University*

Learn from an onsite investigator who is conducting air and soil warming experiments in an eastern deciduous forest that contains a number of tree species including red, black and white oaks and sugar and red maples, and is near warm end of the ranges of several species (southern limits of sugar maple, sweet birch, and chestnut oak). Researchers plant seeds and seedlings of selected tree species in common gardens established in temperature-controlled, open-top chambers. The experimental design involves three temperature regimes (ambient, +3°C and +6°C) and two light regimes (closed forest canopy (low light)) and gap conditions (high light).

***Jim Clark Lab Website***

<http://www.nicholas.duke.edu/people/faculty/clark/pages/research.html#warming>

**Climatic change and ants: an experimental approach 11:30AM-11:40AM**

Learn about field studies being conducted to understand the consequences of global climatic change for local community structure and associated ecosystem processes. Specifically, members of Rob Dunn’s lab are investigating whether projected temperature increases have the potential to exacerbate the impact of fire ants and affect the abundance and/or geographic distribution of native and non-native ants by using large open-top environmental chambers to simultaneously manipulate air and soil temperatures in a temperate mixed hardwood forest.

***Project Summary from Rob Dunn Lab Website***

<http://cl3-dunnlabg5.zo.ncsu.edu/~dunn_lab/duke_forest_site/index.html>